

**PRODUCT
UPDATE**

Date: APRIL 1, 1989

Subject: Current LCD Module Listing

GENERAL INFORMATION

The following information is for use as a quick guide reference for all alphanumeric modules.
Please refer to our complete range of alphanumeric catalogs for more details on any model.
Please refer to the graphic catalog for more information on all graphic LCD modules.

Densitron offers the widest variety of alphanumeric models in the industry.

We offer four LCD technologies which are as follows;

1. TN - Twisted Nematic (bottom or top viewing angle)
2. STN - Supertwisted Nematic (wide viewing angle and high contrast ratio)
3. NTN - New Twisted Nematic (wide viewing angle and high contrast ratio)
4. FSTN - Film Supertwisted Nematic (exceptional viewing angle and contrast ratio)

Note: FSTN is the latest technology for character modules - consult our sales reps for more details

The following table illustrates the operating temperature for each LCD technology and power supply options

TECHNOLOGY OPTION	POWER SUPPLY	OPERATING TEMP (°C)
TN (TWISTED NEMATIC)	+5V	0 TO 50
TN WITH 'W' OPTION	+5V AND -5V	0 TO 50
TN WITH 'H' OPTION	+5V AND -5V	-20 TO 70
STN WITH EL BACKLIGHT	+5V	0 TO 40
STN WITH EL BACKLIGHT	+5V AND -5V	0 TO 50
STN WITH LED BACKLIGHT	+5V AND -5V	0 TO 40
FSTN (NEW FILM STN)	+5V	0 TO 40
FSTN (NEW FILM STN)	+5V AND -5V	0 TO 40

SPECIAL NEW ADDITIONS TO OUR RANGE ARE

a) SOME STN MODELS ARE AVAILABLE WITH LED BACKLIGHT

b) ALL STN MODELS WITH EL BACKLIGHT ARE AVAILABLE IN OUR NEW GRAY MODE POLARIZER OPTION WHICH OFFERS DARK BLUE CHARACTERS ON A LIGHT GRAY BACKGROUND

c) FSTN IS AN IMPROVED NEW TECHNOLOGY OF STN AND IS AVAILABLE TO ORDER FROM FACTORY NOW IN THE MODELS WHICH ARE ILLUSTRATED WITH EITHER * OR **.

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ALPHANUMERIC CHARACTER MODULES

Format	Model#	Overall Size (W x H x D)	Viewing Area	Char. Ht. (mm)	TECHNOLOGY Options	POWER Supply	Fluid Options	Backlight Type
1 X 8	LM65	58.0x32.0x12.0	35.0x15.0	4.45	TN,STN*	+5V,+5V	H	EL
	LM465	58.0x32.0x14.0	35.0x15.0	4.45	TN	+5V	N/A	LED(72mA)
1 X 16	LM12	85.0x36.0x12.0	63.5x15.8	5.50	TN,STN*	+5V+5V	H	EL
	LM61	80.0x36.0x12.0	64.5x13.8	5.50	TN,STN*	+5V,+5V	H	EL
	LM67*	80.0x36.0x12.0	64.5x13.8	5.73	TN,STN**	+5V,ALL	H/W	EL
	LM71*	115.0x35.0x10.0	99.0x13.0	7.95	TN,STN**	+5V,ALL	H	EL
	LM107*	85.0x36.0x13.5	63.5x15.8	5.50	TN,STN**	+5V,ALL	H	EL
	LM108	82.5x23.0x10.0	57.0x10.0	4.50	TN	+5V	N/A	EL
	LM301	151.0x40.0x9.3	120.0x23.0	12.71	TN	+5V	H/W	EL
	LM407*	85.0x36.0x14.0	63.5x15.8	5.50	TN,STN	+5V,TWIN	W	LED(84mA)
	LM412	85.0x36.0x14.0	63.5x15.8	5.50	TN	+5V	W	LED(168mA)
	LM2012	85.0x36.0x9.6	63.5x13.8	5.20	TN	+5V	H	EL
	LM2015	80.0x36.0x11.0	64.5x13.8	5.20	TN	+5V	H	EL
	LM2020*	80.0x36.0x11.0	64.5x13.8	5.20	TN	+5V	H	EL
	LM2128*	122.2x33.2x11.0	99.0x13.0	8.06	TN,NTN	+5V,+5V	H	EL
	LM4012	85.0x36.0x12.5	63.5x13.8	5.20	TN	+5V	H	LED(30mA)
	LM4015	80.0x36.0x12.0	64.5x13.8	5.20	TN	+5V	H	LED(30mA)
	LM4020*	80.0x36.0x12.5	64.5x13.8	5.20	TN	+5V	H	LED(30mA)
	LM4128*	122.2x33.2x14.0	99.0x13.0	8.06	TN,NTN	+5V,+5V	H	LED(150mA)
	LM4617	61.0x30.0x10.5	53.5x12.0	4.73	TN	+5V	H	LED(35mA)

*Models with single-chip, operate as 2x8 modules. Cost slightly less than others

1 X 20	LM68	80.0x36.0x12.0	63.3x13.8	3.80	TN,STN*	+5V,+5V	H	EL
	LM105	80.0x36.0x10.0	63.3x13.8	4.50	TN	+5V	N/A	EL
	LM106	115.0x35.0x10.0	99.0x13.0	5.90	TN	+5V	N/A	EL
	LM302	180x40.0x9.3	149.0x23.0	12.71	TN	+5V	H/W	EL
1 X 24	LM13	118.0x36.0x13.0	93.5x15.8	5.50	TN,STN*	+5V,+5V	H	EL
	LM303	208.0x40.0x9.3	178.0x23.0	12.71	TN	+5V	H/W	EL
	LM413	118.0x36.0x14.0	93.5x15.8	5.50	TN	+5V	N/A	LED(190mA)
1 X 32	LM109	174.5x31.0x14.0	141.2x16.8	5.90	TN,STN	+5V,+5V	H	EL
	LM2132	174.5x31.0x11.2	123.5x16.5	5.20	TN	+5V	H	EL
1 X 40	LM14	182.0x33.5x13.0	154.5x15.8	5.50	TN,STN*	+5V,+5V	H	EL
	LM760	285.0x40.0x12.0	245.0x20.0	12.71	TN,STN*	+5V,+5V	H	EL
	LM2131	182.0x33.6x11.2	152.2x16.5	5.20	TN	+5V	N/A	EL
	LM414	182.0x33.5x16.0	154.5x15.8	5.50	TN	+5V	N/A	LED(180mA)
1 X 80	LM18	264.0x50.0x15.0	207.0x16.0	3.31	TN,STN*	+5V,+5V	H	EL
2 X 8	LM70	58.0x32.0x12.0	35.0x15.0	3.80	TN,STN**	+5V,ALL	H/W	EL
	LM470	58.0x32.0x14.0	35.0x15.0	3.80	TN,STN	+5V,TWIN	H/W	LED(72mA)
2 X 12	LM4221	55.7x50.0x13.0	44.5x15.5	4.95	TN	+5V	H	LED(15mA)

All modules with LED backlight are available in red, green, yellow and amber color

All dimensions are in mm - Divide data by 25.4 to obtain imperial dimensions (inches)

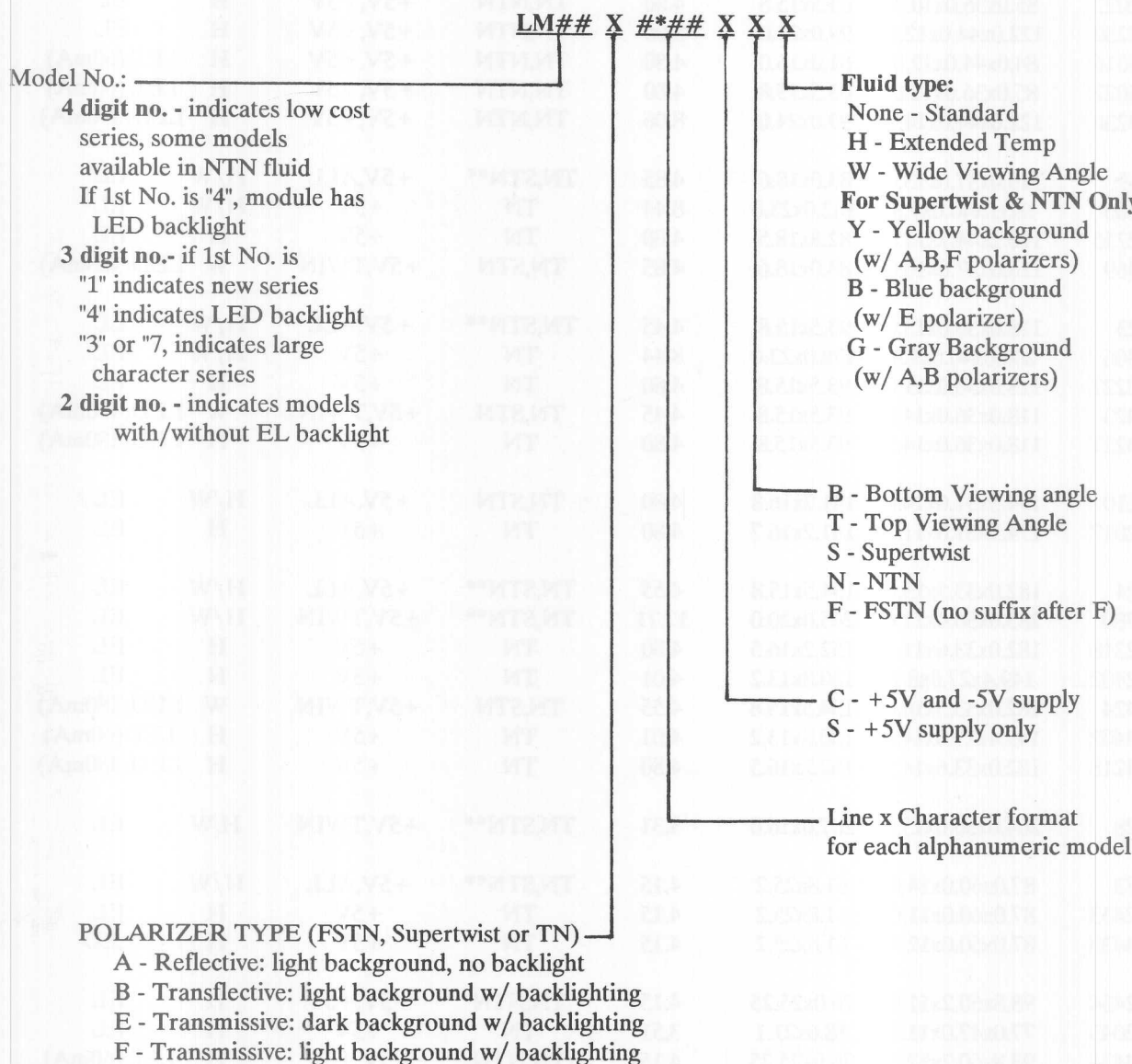
ALPHANUMERIC CHARACTER MODULES

Format	Model#	Overall Size (W x H x D)	Viewing Area	Char. Ht. (mm)	TECHNOLOGY Options	POWER Supply	Fluid Options	Backlight Type
2 X 16	LM22	85.0x36.0x12.0	63.5x15.8	4.45	TN,STN**	+5V,ALL	H/W	EL
	LM66	84.0x44.0x15.0	61.0x15.8	4.85	TN,STN**	+5V,ALL	H/W	EL
	LM304	151.0x40.0x9.3	120.0x23.0	8.44	TN	+5V	H/W	EL
	LM422	85.0x36.0x14.0	63.5x15.8	4.45	TN,STN	+5V,TWIN	W	LED(168mA)
	LM2016	84.0x44.0x11.0	61.0x16.0	4.80	TN,NTN	+5V,+5V	H	EL
	LM2022	85.0x36.0x10.3	63.5x15.8	4.80	TN,NTN	+5V,+5V	H	EL
	LM2230	122.0x44.0x12.0	99.0x24.0	8.06	TN,NTN	+5V,+5V	H	EL
	LM4016	84.0x44.0x12.0	61.0x16.0	4.80	TN,NTN	+5V,+5V	H	LED(60mA)
	LM4022	85.0x36.0x12.0	63.5x15.8	4.80	TN,NTN	+5V,+5V	H	LED(60mA)
	LM4230	122.0x44.0x14.3	99.0x24.0	8.06	TN,NTN	+5V,+5V	H	LED(190mA)
2 X 20	LM69	116.0x37.0x13.0	83.0x18.6	4.85	TN,STN**	+5V,ALL	H/W	EL
	LM305	180.0x40.0x9.3	162.0x23.0	8.44	TN	+5V	H/W	EL
	LM2215	116.2x44.2x11.0	82.8x18.5	4.80	TN	+5V	H	EL
	LM469	116.0x37.0x16.0	83.0x18.6	4.85	TN,STN	+5V,TWIN	W	LED(168mA)
2 X 24	LM23	118.0x36.0x13.0	93.5x15.8	4.45	TN,STN**	+5V,ALL	H/W	EL
	LM306	208.0x40.0x9.3	178.0x23.0	8.44	TN	+5V	H/W	EL
	LM2227	118.0x36.0x11.0	93.5x15.8	4.80	TN	+5V	H	EL
	LM423	118.0x36.0x14.0	93.5x15.8	4.45	TN,STN	+5V,TWIN	W	LED(190mA)
	LM4227	118.0x36.0x14.9	93.5x15.8	4.80	TN	+5V	H	LED(180mA)
2 X 32	LM110	174.5x31.0x14.0	141.2x16.8	4.80	TN,STN	+5V,ALL	H/W	EL
	LM2017	174.5x31.0x11.2	141.2x16.7	4.80	TN	+5V	H	EL
2 X 40	LM24	182.0x33.5x13.0	154.5x15.8	4.55	TN,STN**	+5V,ALL	H/W	EL
	LM780	285.0x56.0x12.0	245.0x20.0	12.71	TN,STN**	+5V,TWIN	H/W	EL
	LM2218	182.0x33.6x11.2	152.2x16.5	4.80	TN	+5V	H	EL
	LM2402	149.4x27.0x8.1	130.8x13.2	4.01	TN	+5V	H	EL
	LM424	182.0x33.5x16.0	154.5x15.8	4.55	TN,STN	+5V,TWIN	W	LED(180mA)
	LM4402	149.4x27.0x14.6	130.8x13.2	4.01	TN	+5V	H	LED(60mA)
	LM4218	182.0x33.6x14.3	152.2x16.5	4.80	TN	+5V	H	LED(180mA)
2 X 80	LM28	264.0x50.0x15.0	207.0x16.0	3.31	TN,STN**	+5V,TWIN	H,W	EL
4 X 16	LM73	87.0x60.0x14.0	61.8x25.2	4.15	TN,STN**	+5V,ALL	H/W	EL
	LM2433	87.0x60.0x11.0	61.8x25.2	4.15	TN	+5V	H	EL
	LM4433	87.0x60.0x12.5	61.8x25.2	4.15	TN	+5V	H	LED
4 X 20	LM2434	98.8x60.2x11.0	76.0x25.25	4.15	TN,NTN	+5V,+5V	H	EL
	LM2043	77.0x47.0x11.5	58.6x21.1	3.51	TN	+5V	H	EL
	LM4434	98.8x60.2x12.5	76.0x25.25	4.15	TN,NTN	+5V,+5V	H	LED(60mA)
	LM4043	77.0x47.0x16.0	58.6x21.1	3.51	TN	+5V	H	LED(190mA)
	LM4420	98.8x60.2x14.0	76.0x25.25	4.15	NTN	+5V	H	LED(120mA)
4 X 24	LM2442	118.0x54.0x11.0	88.0x27.6	4.85	TN	+5V	H	EL
4 X 40	LM44	215.0x60.0x17.5	160.x34.0	4.85	TN,STN**	+5V,TWIN	H/W	EL
	LM790	280.0x88.0x13.0	244.0x68.0	12.71	TN,STN**	+5V,TWIN	H/W	EL
	LM2457	190.0x54.0x11.0	147.0x29.5	4.27	NTN	TWIN	H	EL
	LM4457	190.0x54.0x14.9	147.0x29.5	4.27	NTN	TWIN	H	LED(180mA)

* denotes models available in FSTN with +5V operation : ** denotes models available in FSTN with +5V and -5V operation

LCD module Part No. Explanation For all Alphanumeric models

Densitron features a "build-a-part-number" system to identify its Liquid Crystal Display modules. Obtain the Model No. based on the desired format and character size. Polarizer type determines overall look and viewability in various ambient lighting conditions. Fluid type and viewing angle are determined by environmental and ergonomic considerations. An explanation of the part number breakdown is given below:



* LED backlit modules have "G" or "R" after polarizer type to indicate green (standard) or red (optional) backlight color.

Supertwist, FSTN and NTN modules are not available with "H" or "W" fluids.

Cat. # AREF1